

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given on two telephone interviews with Attorney **Benjamin A. Berkowitz** (registration # 59,349, tel: 202 295-4620) on **October 15, 2010** and **November 1, 2010** to cancel non-elected Claims 8-12 and to amend Claim 1 as following:

Claim

Claims 8-12 please cancel Claims 8-12

Claim 1 at line 6 please insert the phrase "in a conveyance direction" to be between "F (kg/cm)" and "in a range of"

DETAILED ACTION

2. This Office Action is in response to **Amendment** filed on September 9, 2010, which is in response to Non-Final office action filed on March 12, 2010. With such an amendment along with above Examiner's Amendment, **Claims 1, 3-9 and 11-12 are amended; non-elected Claims 8-12 (Group II) are cancelled, while no new claim is added.**

To be specific, parent **Claim 1** is now "twice-amended" in two ways including; (A) to incorporate the detail definition of tension (F) in specification so that it is in a conveyance direction, and (B) to use the proper language for polymer electrolyte so to overcome claim objection. Applicants allege that the support for tension is from page 7 in the middle section of Remarks (see **page 25 at line 17** in specification).

A total of four **IDS'** (1 page each) are filed so far. Examiner **accepts Applicants' four drawing sheets with Figures 1-4** filed along with this application (a brief description is on page 4). **Claims 1-7 with only one independent claim (Claim 1) are now pending.** An action follows. Only three "A"-cited references are found in international search report in Applicants' priority paper **WO 2004/088678 A1 to Nodono for PCT/JP2004/004068.**

3. Claim rejections under **Non-Final** Office Action filed on March 12, 2010 are now removed for the reasons given in paragraphs 4-13 thereafter.

Allowable Subject Matter

4. Claims 1-7 are allowed.

5. The following is an examiner's statement of reasons for allowance: The above Claims 1-7 is allowed over the closest references:

6. The limitation of "twice-amended" parent **Claim 1** in present invention relates to a process for producing a polymer electrolyte membrane. The process "comprises" two steps including:

(A) coating a solution of a polymer electrolyte on at least one surface of a porous substrate; and

(B) laminating the coated porous substrate with a supporting material while applying a tension F (kg/cm) "in a conveyance direction" in a range of the following expression (A) to the coated porous substrate.

$$0.01 \leq F \leq 10 \quad (A)$$

See other limitations of dependent **Claims 2-7**.

7. Applicant has now on this amendment claimed in "twice-amended" **Claim 1** an unexpected way of obtaining some **polymer electrolyte membranes (PEM)**, it is achieved by comprising two steps including: (A) **coating a solution of a polymer electrolyte on at least one**

surface of a porous substrate; and (B) **laminating** the coated porous substrate and a supporting material **while applying a tension F (kg/cm) being in the range of 0.01 and 10.** Open language “**comprising**” is applied to the process of parent Claim 1.

8. Attention is directed to the fact that the tension **F (kg/cm)** is now defined as “**in a conveyance direction**”, which is exactly opposite to the term “**pressure**” cited by the involved references. According to Applicants’ remark on page **6** at top, **the term “tension” as “in a conveyance direction” refers to a force in the longitudinal direction (machine direction) of the substrate.** See the detail in Figure #1. Applicants allege that the support for tension is from page **7** in the middle section of Remarks (see **page 25 at line 17** in specification). Previous 102 and 103 rejections cannot stand as follows:

9. As discussed earlier, **two** primary references including **Stone and Kosako** only prepare some proton-conducting electrolyte type membranes (PEM) along with its derived device in multilayer architect to be particularly useful for **fuel cell operation**. The process of preparation is achieved by fundamentally comprising the above-mentioned **two** steps including: (A) **step of impregnating** the porous base material with some sulfonic acid-containing polymer electrolyte solution, followed by (B) **step of laminating** so as to achieve the desired multilayer architect.

10. Although the laminating is certainly and routinely done with some pressure according to the art, such a pressure-laminating is not falling in the claimed tension F (kg/cm) since they are in different direction to the substrate as discussed above.

11. Two secondary references including **Sato and Yoshio** even in combination still cannot fix the fundamental deficiency on the issue between “tension and pressure”. This is based on the fact that Sato and Yoshio only disclose using the specified range in the viscosity (Claim 4) and concentration (Claim 5) for PE solution.

12. It is noted by this Examiner that even the step of laminating is applied, tension defined as “in a conveyance direction”, which is exactly opposite to the term “pressure” cited by the involved references. Different process will certainly result different polymer electrolyte membrane product. Therefore, the references in combination cannot disclose or suggest such a process for making such a polymer electrolyte membrane as discussed above.

13. After further examination and search, the examiner found the following prior art did not teach the claimed limitation:

US 5,910,378 to Debe et al. only discloses the making of some multiple-layered membrane to be useful as components for membrane-electrode assemblies. Laminating step may be used. See column 18, line 64 – column 19, line 28; column 20, line 4-6. The impregnating with polymer electrolyte (PE) in the form as solution is not disclosed or suggested.

Additionally, **tension defined as “in a conveyance direction”, which is exactly opposite to the term “pressure” cited by the involved references.**

14. As of the date of this office action, the examiner has not located or identified any reference that can be used singularly or in combination with another reference including the above references to render the present invention anticipated or obvious to one of the ordinary skill in the art. Therefore, the independent process **Claim 1** is allowed for the reason listed above. Since the prior art of record fails to teach the present invention, the remaining pending dependent **Claims 2-7** are passed to issue.

15. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu whose telephone number is (571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Dr. Vasu Jagannathan, can be reached on (571) 272-1119. The **fax** number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications.

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/Peter D. Mulcahy/
Primary Examiner, Art Unit 1762

/Henry S. Hu/
Examiner, Art Unit 1764

November 6, 2010